PIERRE DUCHARTRE.

As announced in our issue of November 8, 1894, the *doyen* of French botanists died on the 5th of that month, "having passed away without suffering, at the advanced age of eighty-three." Pierre Duchartre was pre-eminently a practical botanist, whose teachings were largely based upon actual knowledge, acquired by observation and experiment. Almost before the foundation of the present German school of botanists, of whom Sachs was one of the earliest exponents, Duchartre published (1867) the first edition of his well-known and highly esteemed "Éléments de Botanique." It was the result of thirty years' study and investigation; his first paper having appeared as early as 1836. It is true that Sachs's "Handbuch der Experimental Physiologie der Pflanzen" preceded it by one year; but for some years Duchartre's book held its own, not only in France but also in this country. As we learn from a sketch of his life by Mr. Gaston Bonnier,[1] Duchartre commenced his botanical studies under exceptionally difficult conditions, even for that period; but by great industry and perseverance he soon gained for himself a name and position which he maintained till the last. In 1843 he took up his abode in Paris, where he spent the last fifty years of his life, engaged in teaching, writing, and original research. In 1861 he replaced Payer at the Académie des Sciences, and succeeded him in the Botanical chair at the Sorbonne. For many years Duchartre was one of the principal supporters of the Société Nationale d'Horticulture, and he was seven times elected President of the Société Botanique de France, of which he was one of the founders. He was also President of the Société Nationale d'Agriculture, and the Académie des Sciences. Physiology and organology, including teratology, were his principal branches of study; but his very numerous contributions to botanical and horticultural literature cover a much wider field. Systematic botany, however, received comparatively little attention from him; a monograph of the Aristolochiaceæ being his chief work in this direction. His last work was a summary, from the German, of Engler's additions to Hehn's book on the native countries of cultivated plants. It appeared in the *Journal* of the French Horticultural Society a month before his death.

H.

NOTES.

THE remains of the late Prof. Cayley were interred at Cambridge on Friday, and, notwithstanding the inclemency of the weather, snow having fallen heavily during the night, the proceedings were attended by a large number of persons. We are indebted to the *Times* for the following account of the funeral:—The body was brought from Garden House at two o'clock to Trinity College, and was met at the great gate by a procession numbering about 300 gentlemen, among them being many notable men of science. The pall-bearers were the Vice-Master of Trinity (Mr. Aldis Wright), Dr. Glaisher, the Right Hon. George Denman, Prof. Jebb, M.P., Prof. Sir Robert Ball, Prof. J. J. Thomson, Lord Kelvin, and Prof. Sir G. G. Stokes. The choir headed the procession. Then came the officiating clergy—the Master of Trinity, the Bishop of Durham, and the Rev. R. St. John Parry, senior dean. Following the mourners came the Fellows of Trinity College—Mr. J. Prior, Dr. Jackson, Mr. H. M. Taylor, Mr. B. E. Hammond, Dr. Kirkpatrick, Dr. Stanton, the Rev. A. H. F. Boughey, Dr. Verrall, Mr. W. W. R. Ball, Mr. R. D. Hicks, Mr. R. T. Glazebrook, Mr. F. J. H. Jenkinson, Dr. Postgate, Mr. Fraser, Mr. J. G. Fraser, Mr. J. D. Duff, Mr. A. N. Whitehead, Dr. Sidgwick, Mr. J. N. Langley, Mr. S. M. Leathes, Rev. C. Platts, Mr. C. Williams' Mr. A. A. Bevan, Mr. G. T. Walker, Mr. W. C. Whetham, Mr. G. A. Davies, Mr. Capstick, Mr. Innes, Mr. Nicholson, Mr. Cowell, Mr. Moore, and Mr. Wyse. Then came the Vice-Chancellor of the University and the representatives of the German and United States Embassies—viz. H.S.H. Prince Hermann von Schoenburg-Waldenburg for the German Ambassador, and Mr. D. D. Wells on behalf of the United States Ambassador. Baron d'Estournelles de Constant had intended to be present as representative of the French Ambassador, but was prevented at the last moment. The heads of Houses included the Masters of Peterhouse, Clare, Caius, St. Catharine's, Jesus, Christ's, St. John's, Emmanuel, Sidney Sussex, Downing, and Ayerst Hall, the President of Queens', and the Principal of Ridley Hall. The Royal Society was represented by Lord Rayleigh and Prof. Michael Foster; the Royal Astronomical Society by Mr. Knobel; the Mathematical Society by Major MacMahon, Mr. Kempe, Prof. Elliott, and Prof. Henrici; the Cambridge Philosophical Society by Mr. Larmor and Mr. Newall. The attendance likewise included Profs. J. R. Lumby, H. B. Swete, E. C. Clark, A. Macalister, T. M'Kenny Hughes, W. J. Lewis, H. E. Ryle, E. B. Cowell, J. E. B. Mayor, J. A. Ewing, W. W. Skeat, Sir G. M. Humphrey, and C. S. Roy; the Public Orator, the Registrary, Dr. Routh, and many others. An impressive service was held in the chapel of Trinity College. The concluding portion of the service took place at the Mill Road Cemetery, the Bishop of Durham committing the body to the grave.

WE are glad to see that the Duke of Argyll has recovered sufficiently from his illness to remove from the residence of Lord Kelvin to Inverary Castle.

THE very extensive and valuable botanical library of the late Prof. N. Pringsheim has been presented to the German Botanical Society, of which he was President, together with a sum of 25,000 marks for its maintenance.

THE Berlin correspondent of the *British Medical Journal* reports that a gift of 1,500,000 marks (£75,000) has come to the German Royal Academy of Sciences from a widow lady, Frau Wenzel. The sum is to remain as a foundation, and the interest used to assist scientific inquiries of importance.

THE death is announced of Dr. Lombard, the author of a standard work on Climatology from a medical point of view, and in 1882 the President of the International Congress of Hygiene at Geneva. An eminent German engineer—Hermann Gruson—has also just died, at Magdeburg.

REUTER'S correspondent at Christiania reports that earthquake shocks were felt at Christiansund, Molde, Aalesund, and Bergen between 12.15 and 12.43 on the morning of Tuesday, February 5, causing windows to rattle and disturbing furniture. The direction of the vibrations was from south-east to north-west.

A DEPUTATION from the recent Indian Medical Congress has (says the *Lancet*) waited upon Sir Anthony MacDonnell, controlling the Home Department, to urge upon the Government of India the extension of facilities for the study of preventive medicine and the prosecution of scientific research in that country. Sir Anthony MacDonnell, in his reply, assured the deputation of his interest in the objects in view, and announced that, in addition to the bacteriological laboratory at Agra, a similar institution for experimental research was to be established at Lahore.

THE United States Government has established an additional wind signal, to be known as the "Hurricane Signal," to be used in addition to the storm signals previously shown. The signal consists of two red flags with black centres, shown one above the other, and will be used to announce the expected approach of tropical hurricanes, and also of those extremely severe and dangerous storms which occasionally move across the Lakes and the northern Atlantic shore. Whenever instructions are received to show this signal at any station, every effort has to be made to distribute the information, and all vessels have to be notified that it is dangerous to leave port.

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[1] "La Vie et la Carrière Scientifique de M. Duchartre," *Revue Générale de Botanique*, Décembre 1894.

THE Academy of Natural Sciences of Philadelphia, acting on the report of the Committee on the Hayden Memorial Geological Award, have voted the Hayden medal, and the accumulated interest on the fund, to Prof. G. A. Daubrée. The recipient in 1893 was Prof. Huxley. Prof. Daubrée was born in Metz, June 25, 1814, and is therefore now in his eighty-second year. He graduated from the École Polytechnique in 1834, and immediately received a commission to assist in the geological exploration of Algeria. He was called to the chair of Geology in Strasburg in 1839, and was Dean of its Scientific Faculty in 1852. He was appointed Engineer-in-Chief in 1855. In 1861, upon the death of the distinguished Cordier, he was selected to replace him in the Museum of Natural History, and as Professor of Mineralogy in the École des Mines, as well as in the Académie des Sciences in Paris. His writings have been numerous, original, and important, and his researches into the intricate causes of crystalline structure, and in the domain of experimental geology, are of exceptional value.

BY the death of Dr. F. Buchanan White, which took place on December 3, 1894, at Perth, in his fifty-third year, Scotland has lost one of her most active naturalists. His special branches were entomology and botany. Dr. White was one of the founders of the Perthshire Society of Natural Sciences, of the Scottish Cryptogamic Society, and of the East of Scotland Union of Naturalists' Societies; and was the originator and first editor of the *Scottish Naturalist*. He left, at the time of his death, a nearly completed "Flora of Perthshire." The *Entomologist's Monthly Magazine* notes that his friends are endeavouring to raise a fund to erect a memorial to him. It is proposed to place a mural brass tablet in St. Ninian's Cathedral, and also to procure an enlarged photograph, to be hung in the lecture room of the Perthshire Society of Natural Science. Any who wish to contribute to this memorial may send subscriptions to either Vincent L. Rorison, Dean of St. Andrews, The Deanery, Perth; or Henry Coates, President of the Perthshire Society of Natural Science, Pitcullen House, Perth.

DR. HERMANN WEBER, a Fellow of the Royal College of Physicians and Surgeons, gave, last December, the sum of £2500 in trust for the purpose of founding a prize to be called the "Weber-Parkes" prize, to be given at intervals for the best essay on tubercular consumption. It has now been resolved that the prize be awarded triennially to the writer of the best essay upon some subject connected with the etiology, prevention, pathology, or treatment, of tuberculosis, especially with reference to pulmonary consumption in man; that, in making the award, the College have regard to careful collection of facts and original research; that the value of the prize be 150 guineas, or such sum as the interest accrued on the capital, after payment of expenses, will permit; that a bronze medal be awarded to the holder of the prize, and a similar medal, to be distinguished as the "second medal," to the essayist who comes next in order of merit. The competition will be open to members of the medical profession in all countries, the essays to be type-written, and, if written in a foreign language, to be accompanied by a translation in English. It is a condition of the competition that each prize essay shall become the property of the College, though the College may grant its author permission to publish it.

ON Friday last, a deputation from the British Medical Association and the Ophthalmological Society waited upon Mr. Bryce, President of the Board of Trade, to urge the adoption of more precise tests for eyesight in the examination for the mercantile marine and railway servants. Dr. Macnamara, in introducing the deputation, said that railway and merchant marine authorities did not insist upon proper precautions being taken to exclude men with imperfect eyesight from being employed as signalmen, and in the movement of trains and vessels. Dr. Argyll Robertson held it was necessary that the tests should be adequate and uniform, that they should be skilfully employed, and that they should be applied at regular intervals. The tests should elicit three conditions: (1) the acuteness of vision possessed by the applicant; (2) the state of refraction of the candidate's eye; and (3) his acuteness of colour perception. Mr. Bryce, in the course of his reply, said he was glad to gather from what had been said by members of the deputation, that the tests embodied in the Board's circular of last September, to be applied to masters and mates, were recognised as being satisfactory, except in regard to the question of refraction. He was perfectly certain, however, that if the railway companies' examinations did not cover this defect, they would soon take steps to apply the test for it. But the Board of Trade had no statutory powers as regarded the companies in this matter, neither had they any power to apply the tests to all persons entering the merchant service.

IN June of last year, the Society for the Preservation of the Monuments of Ancient Egypt discussed the importance of having a thorough survey made of the Nile Valley from the First to the Second Cataract—that is to say, of the district which will be partially converted into a high reservoir when the dam at Assouan, even in its reduced proportions, is constructed. A draft scheme for such an archæological survey has been drawn up by the Committee appointed to decide upon the regions to be investigated and the work to be done. A list has been compiled to show the most important antiquities along the Nile Valley which require examination and copying. The Committee propose that the survey should commence with a preliminary reconnaissance, providing a general map and maps of sites, to be followed by plans of the buildings and special inquiries indicated in subsequent sections. It is probable that, under the special circumstances of the case, if the maps and plans referred to cannot be prepared for publication in Egypt, application to the Board of Agriculture might secure their multiplication and reduction by the Ordnance Survey. Such a course would secure perfect reproduction and a great economy. It is proposed that illustrations, other than plans, should be based on photographs, to be subsequently processed in printer's ink. This would secure permanency and great economy, and avoid all the expenses of hand illustration, which alone was available in the expeditions of 1789 and 1844. The Committee suggest that a non-commissioned officer of the Royal Engineers, who has passed through the Photographic School at Chatham, should be attached to one of the companies of Royal Engineers stationed in Egypt, and be employed in obtaining the photographs. It is understood that the preliminary reconnaissance is now about to commence, under the direction of the Public Works, Irrigation, and Archæological Departments of the Egyptian Government, very much in accordance with the detailed scheme, printed copies of which have been forwarded to Egypt.

A PAPER on boiler explosions, read at the Institution of Civil Engineers on January 29, by Mr. William H. Fowler, presents some points of interest. The theories, such as "deferred ebullition," "disassociation of water," "spheroidal condition," which have been propounded to account for such explosions, are well known. Mr. Fowler showed that it was the hot water, rather than the steam, in the boiler which formed the source of destructive energy. In regard to the causes of boiler explosions, there is nothing occult or mysterious. They can, as a rule, be traced by patient investigation to the operation of simple and well-known facts. Thus when a boiler-shell is normally in a state of high tension, if once a rupture takes place by the action of static stresses on a locally weak spot, the stored-up energy is capable not only of tearing the boiler to pieces, but of producing all the other destructive effects observed in connection with such disasters. Prominent among the principal causes of explosions is the corrosion of the boiler-shell. Some explosions have their origin in the stresses arising from expansion and contraction due to the action of the fire. As an illustration of the stresses set up by unequal expansion and contraction in a boiler, a case was mentioned in which an explosion occurred two hours after the fires were drawn. A frequent source of boiler explosions in the past is the practice of cutting large openings in boiler-shells, without providing compensating strengthening-rings. Overheating from shortness of water is a common cause of boiler explosions, but the operation of this cause is different from the reason formerly assigned to it. Explosions are not the result of turning cold water on to red-hot plates. What takes place is that the overheated plates become gradually softened, with the result that they bulge downwards and are rent at the ordinary working pressure: explosions of this kind are of a relatively mild character. Many explosions arise from excessive pressure in consequence of the defective action of the safety-valve. This may occur in a variety of ways, but the type of valve loaded with a spring-balance is the most prolific source. Finally, explosions sometimes arise from faulty material and construction. As a result of using iron of poor quality with punched holes, incipient flaws are occasionally set up in the seams, and several cases have occurred in which these inherent defects were so situated as to forbid detection when the boiler was put together, and were only revealed by the explosion. These defects show the value in connection with new work of a careful hydraulic test.

THE barometer has been very high over north-west Europe during the past week, and the type of weather over these islands has been anti-cyclonic, with strong easterly winds or gales at several places on our coasts. In the neighbourhood of London the maximum day temperatures have not exceeded 35°, and at night sharp frosts have occurred. In the suburbs a reading of 15° has been recorded, and a few miles distant the temperature fell several degrees lower, with a radiation temperature of 6°·5, while over the midland districts of England the thermometer in the shade has fallen 24° below the freezing point. The *Weekly Weather Report* published by the Meteorological Office states that during the week ending the 2nd inst. the absolute shade minima recorded were—2° at Llandovery on January 28, 1° at Braemar on January 30, and 2° at Hillington on January 27. Over the whole country the temperature ranged from 8° to 13° below the mean for the week. Snow has fallen at many places in different parts of the kingdom.

THE beautiful Alpine phenomenon which the Swiss call "Alpenglühen," is not a simple red glow of the snowy peaks at sunset, but is sometimes intermittent, the glow returning once or twice after it has apparently died away. Dr. J. Amsler, in a recent communication to the Swiss Natural Science Society, explains this repetition by taking into account the various deviations undergone by the sun's rays in passing through the rapidly cooling atmosphere. Since the air is colder in the higher, and warmer in the lower strata, the solar rays undergo a kind of total reflection which makes them pass upwards again, so that when the sun has reached a certain position they will no longer strike the summits. This is the end of the first glow. As the lower air cools, the rays become once more rectilinear, and the second glow sets in. When the sun sinks still lower, its rays are thrown down upon the glaciers by ordinary refraction. This refraction may be intensified by warm air from below reaching the upper regions of the air, which would give rise to the third glow. But the latter is only rarely observed.

IT is gratifying to learn that the Italian Government has appointed a commission to study the violent earthquake which occurred in South Italy on November 16. In the meantime, Prof. Tacchini has established one result of great interest and, possibly, of much practical importance (*R. Accad. dei Lincei, Rend.* iii. 1894, pp. 365-367). The earthquake was registered at Rome by three pendulums in the Collegio Romano. The maximum displacement occurred at 5h. 55m. p.m., Greenwich mean time; but the first movement was registered by the great seismometrograph (length 16m., mass 200 kg.) at 5h. 52m. 25s., by another (length 6m., mass 100 kg.) at 5h. 52m. 30s., and by a third still less delicate (length 1½m., mass 10 kg.) at 5h. 53m. 20s. Now a clock was stopped at the observatory of Messina at 5h. 52m., there being no slight shock previously, and the maximum disturbance was registered at the same moment at the observatory of Catania. It may be inferred, therefore, that before the great shock took place, there was a microseismic motion insensible to man and to ordinary apparatus. But, if an instrument as delicate as that at Rome had been installed at Messina, the beginning of the motion would have been recorded 2½ minutes before the occurrence of the sensible shock.

WE learn from the *Journal of Botany*, that a "Flora of Berkshire," by Mr. Druce, will shortly be published.

THE constant communication kept up by the central authorities at Kew with the directors of the various colonial botanic gardens, is bearing fruit in the numerous botanical publications which proceed from the Colonies. We have on our table the *Bulletin of Miscellaneous Information* from the Royal Botanic Garden, Trinidad, for January 1895; the *Agricultural Journal* of the Leeward Islands for October 1894; and *Notes on Antigua Grasses*, by Mr. C. A. Barber, Superintendent of Agriculture for the Leeward Islands; all containing notes and information of value for the dwellers in the Tropics.

FIVE *Bulletins* of the University of Wisconsin have come to us. One, the first of a Science Series, is on the speed of the liberation of iodine in mixed solutions of potassium chlorate, potassium iodide, and hydrochloric acid, the author thereof being Mr. H. Schlundt. His experiments show that the speed of the reaction increases to a marked degree with temperature. The presence in the mixture of an excess of one or more of the components also increases the speed, and an increase in the degree of concentration acts in the same manner. The presence of hydrobromic acid accelerates the reaction; and, to a less extent, hydrochloric, nitric, and sulphuric acids. Organic acids, however, and boric acid, do not increase the speed. The four remaining *Bulletins* referred to belong to the Engineering Series. In one, Mr. L. F. Loree traces the development of railroads from 1825 to the present time, chiefly dealing with the construction of the permanent way. Some practical hints in dynamo design are given by Mr. Gilbert Wilkes in the second of the series. The next, by Mr. C. T. Purdy, refers to the steel construction of buildings; and the fourth, by Mr. A. V. Abbott, deals with telephones and switchboards.

TWO further communications concerning the new iodine bases are contributed by pupils of Prof. Victor Meyer to the current issue of the *Berichte*. In the first, Mr. John McCrae describes the base and its salts derived from toluene, analogous to the compounds previously described by Prof. Meyer and Herr Hartmann derived from benzene. In the second memoir, Mr. Wilkinson describes a further series derived from para-chlor-iodo-benzene, C_6H_4ClI. The formation of both series occurs precisely as in the case of the benzene derivatives. The base derived from toluene was prepared from the para iodide of toluene as starting point. Its composition is $(C_6H_4 . CH_3)_2I . OH$, iodine apparently acting, as in the bases previously described, in a trivalent capacity, and forming the central element around which the two toluene radicles and the hydroxyl are grouped. The base itself has only been obtained in aqueous solution, but many of the salts crystallise well, and are consequently readily isolated. The iodide, $(C_6H_4 . CH_3)_2I . I$, is precipitated as a white powder, extremely sensitive to light, and melting at 146°. The corresponding chloride and bromide both crystallise from water in needles which melt at almost the same temperature in the neighbourhood of 178°. The bichromate is a particularly beautiful salt, crystallising from hot water in large orange-red plates. It is likewise explosive, detonating when heated. The nitrate, $(C_6H_4 . CH_3)_2I . NO_3$, is very soluble in water, and melts at 139°. The per-iodide is a remarkable compound, $(C_6H_4CH_3)_2I . I_3$, obtained by addition of two further atoms of iodine to the ordinary iodide above mentioned. It crystallises in dark red needles, endowed with a very brilliant lustre, and melting at 156°. In addition to these salts, double salts with the chlorides of gold, platinum and mercury are described, all of which crystallise well and exhibit definite melting points. The base of the series described by Mr. Wilkinson possesses the composition $(C_6H_4Cl)_2I . OH$, being derived from para chlor-iodo-benzene by reactions analogous to those by means of which the base above described was obtained, and similar to those previously described by Prof. Meyer. The iodide, chloride, bromide, nitrate and chromate, as well as double salts with the chlorides of mercury and platinum, have been obtained in well-defined crystals. Hence it would appear that the reactions discovered by Prof. Meyer and Herr Hartmann, between iodosobenzene and silver oxide, and between sulphuric acid and iodosobenzene, which resulted in the preparation of the first iodonium bases, are of pretty general application in the benzene series. These remarkable compounds containing iodine as the grouping element must now, therefore, be regarded as thoroughly well established, and the older idea as to the nature of the iodine atom must give place to a fuller conception of the capabilities of that element.

THE additions to the Zoological Society's Gardens during the past week include a Chacma Baboon (*Cynocephalus porcarius*) from South Africa, presented by Captain Webster; a White-throated Capuchin (*Cebus hypoleucus*) from Central America, presented by Mr. H. W. Manning; a Senegal Parrot (*Pæocephalus senegalus*) from West Africa, presented by Miss Alice Firman.

OUR ASTRONOMICAL COLUMN.

NEW STARS AND NEBULÆ.—The first number of the *Astrophysical Journal* has come to hand. It is practically a continuation of *Astronomy and Astro Physics* in a slightly different form, and is now published by the Chicago University Press. Among the contributions to the journal is a paper, by Prof. W. W. Campbell, on some interesting and significant changes which have occurred recently in the spectrum of Nova Aurigæ. The intensities of the two lines at λ 4360 and λ 5750 appear to have decreased very materially. When Prof. Campbell observed the Nova spectrum in 1892, these two lines were stronger in the Nova than in the nebulæ in the spectra of which they were seen and photographed. Observing last November, however, he found that this condition of things was reversed, the lines appearing relatively fainter in the Nova than in the nebulæ. As is now very well known, the spectra of nebulæ differ both as regards the number and intensity of the lines. The recent observations of the Nova seem to show that the spectrum is not only nebular, but it is approaching the average type of nebular spectrum. Prof. Campbell thus sums up the bearing of spectroscopic observations upon theories proposed to account for the genesis of new stars:—

"The Harvard College Observatory has shown that both Nova Aurigæ and Nova Normæ at discovery possessed substantially identical spectra of bright and dark lines, similarly and equally displaced. Both diminished in brightness and both assumed the nebular type of spectrum. The new star of 1876 in Cygnus probably had nearly an identical history: passing from a bright star with a spectrum of bright and dark lines, to a faint object with a spectrum consisting of one bright line (undoubtedly the nebular line λ 5010, or the two nebular lines λ 5010 and λ 4960 combined). We may say that only five 'new stars' have been discovered since the application of the spectroscope to astronomical investigations, and that three of these have had substantially identical spectroscopic histories. This is a remarkable fact. We cannot say what the full significance of this fact is. One result, however, is very clear: the *special* theories propounded by various spectroscopists to account for the phenomena observed in Nova Aurigæ must unquestionably give way to the more *general* theories."

THE DESIGNATION OF COMETS.—A uniform system of cometary notation is certainly needed. The *Observatory* points out that though the small letters *a*, *b*, *c*, &c., are now generally used to denote the order of discovery, and Roman numerals I., II., III., &c., to indicate the order of perihelion passage, astronomers are not agreed whether to write Comet *a* 1894, Brooks's Comet, or Comet Brooks. It is therefore suggested, and the suggestion deserves to be acted upon, that in the future the order shall be letter, year, Roman numeral, discoverer. The full name of the comet would then run as follows:—Comet *a* 1892, I. (Swift): and if any part of the name be quoted, this order should be preserved. Those who have had to search for observation of comets in astronomical publications, will welcome the system of uniformity in indexing, proposed by our contemporary.

THE NEW CONSTITUENT OF THE ATMOSPHERE.[1]

I. *Density of Nitrogen from Various Sources.*

In a former paper[2] it has been show that nitrogen extracted from chemical compounds is about ½ per cent. lighter than "atmospheric nitrogen."

The mean numbers for the weights of gas contained in the globe used were as follows:—

From nitric oxide	2·3001
From nitrous oxide	2·2990
From ammonium nitrite	2·2987

while for "atmospheric nitrogen" there was found—

By hot copper, 1892	2·3103
By hot iron, 1893	2·3100
By ferrous hydrate, 1894	2·3102

At the suggestion of Prof. Thorpe experiments were subsequently tried with nitrogen liberated from *urea* by the action of sodium hypobromite. The hypobromite was prepared from commercial materials in the proportions recommended for the analysis of urea. The reaction was well under control, and the gas could be liberated as slowly as desired.

In the first experiment the gas was submitted to no other treatment than slow passage through potash and phosphoric anhydride, but it soon became apparent that the nitrogen was contaminated. The "inert and inodorous" gas attacked vigorously the mercury of the Töpler pump, and was described as smelling like a dead rat. As to the weight, it proved to be in excess even of the weight of atmospheric nitrogen.

The corrosion of the mercury and the evil smell were in great

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[1] Abstract of a paper by Lord Rayleigh, Sec. R.S., and Prof. William Ramsay, F.R.S., read before the Royal Society, at a special meeting, on January 31.

[2] Rayleigh, "On an Anomaly encountered in Determinations of the Density of Nitrogen Gas," *Roy. Soc. Proc.* vol. lv. p. 340, 1894.